The Builder.

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STATEMENT having been circulated to the effect, that an accident had occurred to the walls of Covent Garden Theatre, and that another architect had been called in, to examine the extent of the mischief and remedy it,—a confirmation or denial of the assertion was asked for from us by correspondents, and we were led to inquire into the circumstances and look through the building. The result of this is, that we can confidently pronounce the report a fabrication without the least foundation: no accident of any sort has occurred, and no fresh architect has been called in or hinted at.

In making the examination, a fact became known to us which requires to be stated, having especial interest at this moment, when the propriety of preventing the use of wood-bond in brickwork is a matter of question. The whole of the wood-bond in the lower part of the walls of the theatre had decayed entirely, and being of considerable size, 9 in. by 6 in., and even larger, had left the building in an evidently insecure state, only made known by the stripping consequent on the present reconstruction of the interior. In one wall, five bricks thick, it appears that bond on either side of it occupied a thickness equal to three bricks, and was quite rotten! The whole of the timber in this position has now been removed, and its place supplied with *brickwork in cement* to an extent of 800 feet, running measure, so that the building is now considerably stronger in this respect than it ever was before.

The cause of this entire decay within a comparatively short space of time, deserves investigation. Although perhaps, no other reason need be looked for than the effect of the wet mortar and damp brickwork in which the timber was set. The building was of course hurriedly carried up, and the bond (which was in the face of the wall) cased in at once by framing or otherwise, so that the moisture could not evaporate. When timber is placed in the centre of a wall, and so encased that the atmosphere is totally excluded, decay seldom takes place; nor is it likely to do so if, when placed in the inner face of a wall, it is first allowed thoroughly to dry, and then covered by the plasterer: provided, of course, that it be sound timber of a durable sort, and that the insidious access of moisture be prevented.

That it is desirable in the majority of cases to avoid the use of wood bond cannot be doubted. Apart from its shrinking, when not properly seasoned (and so leaving apertures and weaknesses in the walls), and the probability of decay in many situations, its use has often entailed the rebuilding of the walls of structures destroyed by fire, which otherwise might have been kept up. By the substitution of hoop iron bond, as the majority of our readers know, the evils in question may be avoided, and better work obtained, provided that the bond be properly fixed with occasional courses of brickwork in cement. The hoop iron (if pitched and sanded so much the better) should be strained tightly, the whole length of each wall in one piece if possible, and secured at the end by turning it up at right angles, and lapping it over the upper courses; connection at the angles ought not to be forgotten.

Bond timbers are valuable in new work by distributing the various weights, and preventing irregular settlements. The front and back walls of ordinary dwelling-houses, consisting for the most part of slight piers, indifferently executed in too many cases, are more likely to remain sound and unshaken when bond timbers pass through piers and openings (afterwards to be cut out), and so hold the whole together, until the work gets its bearing and consolidates.

An equivalent for this is not provided by the hoop iron *alone*; a cement bond is necessary; but unluckily the additional cost of this, small as it is, is sufficient to prevent the use of it, and so in many cases where wood bond is prohibited, the stability of the structure is made to suffer.*

A correspondent wished to be informed last week if we considered he might use bond-timber in 9-inch external walls; and he said further, that the district surveyor had told him he might not do so.

The second part of schedule D, which treats of external walls, says:—"With regard to other substances than the component materials of external walls,—there may be such *wood* and iron as may be necessary;" and recognizes the necessity of plate, lintel, and bond, by providing that they "must be fixed at a distance from the external face of the wall of four inches at the least." At the end of the clause, however, it says,—"But no timber must be laid into any external wall in such manner, or of such length, as to render the part of the wall above it wholly or in great part dependent upon the wood for support, or so that any such wood might not be withdrawn without endanggering the safety of the superincumbent structure, except in the case of breast-summers."

The district surveyors do not consider this provision binds them to prevent the use of wall-*plates*, even in a 9-inch wall, because of the difficulty of doing so; but they feel themselves not merely authorized, but bound by the spirit, as well as letter, of the clause, in the case of bond, when other expedients may conveniently be resorted to, to object to the use of timber in such a situation.

As to a 14-inch external wall, we are disposed to think there is nothing, strictly speaking, to prevent the use of timber bond as formerly; nevertheless, we strongly advise all builders to avoid it, and adopt, as indeed is now almost universally the case, hoop-iron bond and Roman cement.†

After the above remarks were in type, it occurred to us to inquire at the Metropolitan Buildings office if the referees had expressed any opinion on this subject, although we knew that they had not published any award conveying it. We found that they had done so as far back as May last, in the shape of an award on a joint requisition from Mr. C. Oldfield and the district surveyor of St. Pancras, which the former gentleman had afterwards refused to take up. The matter being one of some importance, and the referees having taken a different view of the question from that which we have expressed above, we are glad to be permitted to bring their decision before the public.

The requisition required "the determination of the official referees as to the legality of inserting continuous wooden plates and bond along and in external walls, to carry the joists and timbers of the building; and whether such plates should be limited in size according to the thickness of the wall, for instance, 4 inches by 3 in a 9-inch wall, 9 inches by 4 in a 14 or 18-inch wall, or 4 inches by 4.

The said referees determined "first as to walls 9 inches thick, that inasmuch as continuous wooden plates 4 inches by 3 inches laid into such walls, would render such walls dependent on the said woodwork for support, and that such woodwork might not be withdrawn without endangering the safety of the superstructure, such construction would not be conformable to the rules as to the construction and materials of external walls in part 2, of schedule D, of the first-mentioned Act.

And secondly, as to walls 14 inches or 18 inches thick, inasmuch as continuous wooden plates 9 inches by 4 inches, or 4 inches by 4 inches, laid into the face of such walls, would render the said walls in great part dependent on such wood for support, and so that such wood might not be withdrawn without endangering the safety of the superincumbent structure, such construction must be deemed contrary to the rules of the said Act."

SOME ACCOUNT OF THE ANCIENT CITY OF SYRACUSE.

THE ancient Syracuse occupied the first rank of all the cities of Sicily, or Magna Græcia, in point both of extent and political importance; and there are few remains of ancient cities, even in Greece herself, which are more interesting to the scholar or the antiquary.

I visited the ruins and the modern city in company with some fellow-students in the summer of 1822. The classical interest of the spot, the beauty of the situation, and the splendour of the climate (noted by Cicero for its sunshine in every day of the year) were such, that not even a week's painful imprisonment in the quarantine, on a subsequent occasion, could diminish my feelings of admiration for this renowned spot.

The present paper being principally devoted to the architectural description of the ancient city, I will not occupy the time of the meeting with a long account of its history; it will be sufficient for our purpose merely to refer to the tradition of its having received its inhabitants, in very early ages of the world, from Egypt and Phœnicia; that they were driven out by the Siculi, who, in their turn, were replaced by a colony from Corinth, led by Archias, one of the Heraclidæ, in the second year of the eleventh Olympiad, or about 732 years before the Christian era. The city was named by them Ortygia, or the island of quails (the same name was originally given to the island of Delos).

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* In the majority of speculative buildings erected within the jurisdiction of the Act, we fear no bond of any kind is now used.

† The following extract from General Pasley's work on "Limes and Calcareous Cements" will serve to shew the strength of hoop-iron in opposition to a tensile force:

"The extraordinary resistance communicated to brick beams by longitudinal hoop-iron bond, the value of which has exceeded our expectations, induced us to try a few experiments on the actual strength of the hoop-iron alone, in opposition to a force tending to tear it to pieces in the direction of its length, and acting from one end, the other being fixed.

First, with 14-inch hoop-iron.—Its thickness being what is described as No. 13 wire gage, or one-sixteenth of an inch nearly, and its weight per foot being 3,520 grains, or 2·6 lbs. Having fixed a piece of this hoop-iron in a vertical position, and suspended weights to the lower end of it, which we gradually increased, it broke down under a total weight of 8,163 lbs., after the iron had elongated thirteen sixteenth parts of an inch in the length of about 18 inches.

Secondly, 1-inch hoop-iron.—We next broke down a piece of hoop-iron 1 inch wide, of No. 13 wire gage, weighing 1,320 grains to the foot, by a total weight of 2,901 lbs., which produced a previous elongation of half an inch.

Thirdly, ¾-inch hoop-iron.—Finally, we broke down a piece of hoop-iron three-quarters of an inch wide, of No. 20 wire gage, and weighing 540 grains to the foot, by a total weight of 1,842 lbs., which produced a previous elongation of one three-eighth of an inch.

The results of these experiments agree very nearly with the statements of the strength of iron of this description in the works of Professor Barlow and Tredgold; and as the strength of iron has been fully investigated, and accurately stated, by these and other authors of reputation, we did not think it worth while to pursue this subject any further."

It has been suggested, that straps of 1¼-inch hoop-iron would be strong enough for connecting the rafters and tie-beams of roofs of moderate span, instead of ordering wrought-iron straps for the purpose.

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